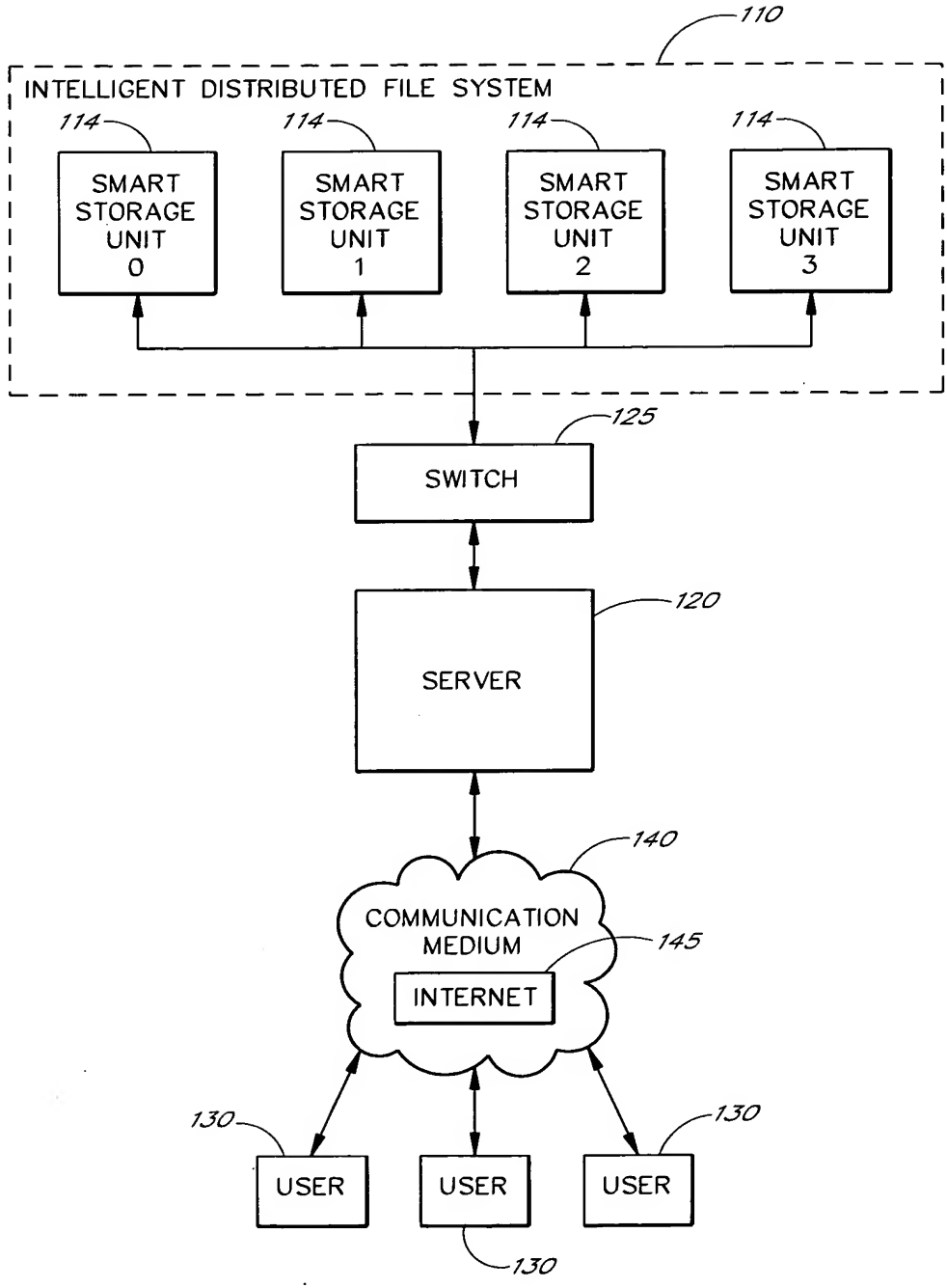

110
INTELLIGENT DISTRIBUTED FILE SYSTEM
114
SMART STORAGE UNIT 0
114
SMART STORAGE UNIT 1
114
SMART STORAGE UNIT 2
114
SMART STORAGE UNIT 3
125
SWITCH
120
SERVER
140
COMMUNICATION MEDIUM
145
INTERNET
130
USER
130
USER
130
USER
130

FIG. 1

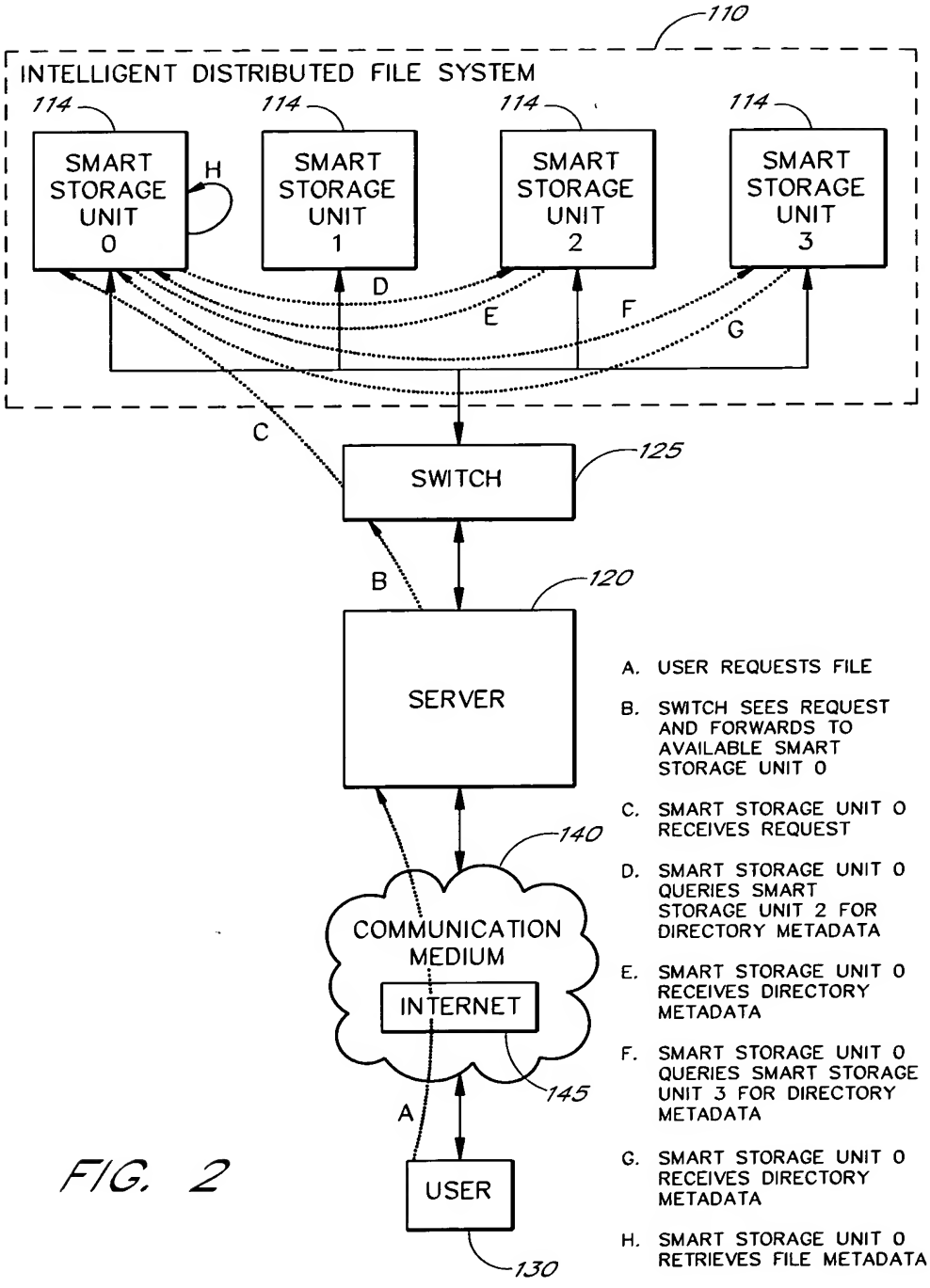

110
INTELLIGENT DISTRIBUTED FILE SYSTEM
114
SMART STORAGE UNIT 0
SMART STORAGE UNIT 1
SMART STORAGE UNIT 2
SMART STORAGE UNIT 3
H
D
E
F
G
C
SWITCH
125
B
120
SERVER
140
COMMUNICATION MEDIUM
INTERNET
145
A
USER
130
A. USER REQUESTS FILE
B. SWITCH SEES REQUEST AND FORWARDS TO AVAILABLE SMART STORAGE UNIT 0
C. SMART STORAGE UNIT 0 RECEIVES REQUEST
D. SMART STORAGE UNIT 0 QUERIES SMART STORAGE UNIT 2 FOR DIRECTORY METADATA
E. SMART STORAGE UNIT 0 RECEIVES DIRECTORY METADATA
F. SMART STORAGE UNIT 0 QUERIES SMART STORAGE UNIT 3 FOR DIRECTORY METADATA
G. SMART STORAGE UNIT 0 RECEIVES DIRECTORY METADATA
H. SMART STORAGE UNIT 0 RETRIEVES FILE METADATA

FIG. 2

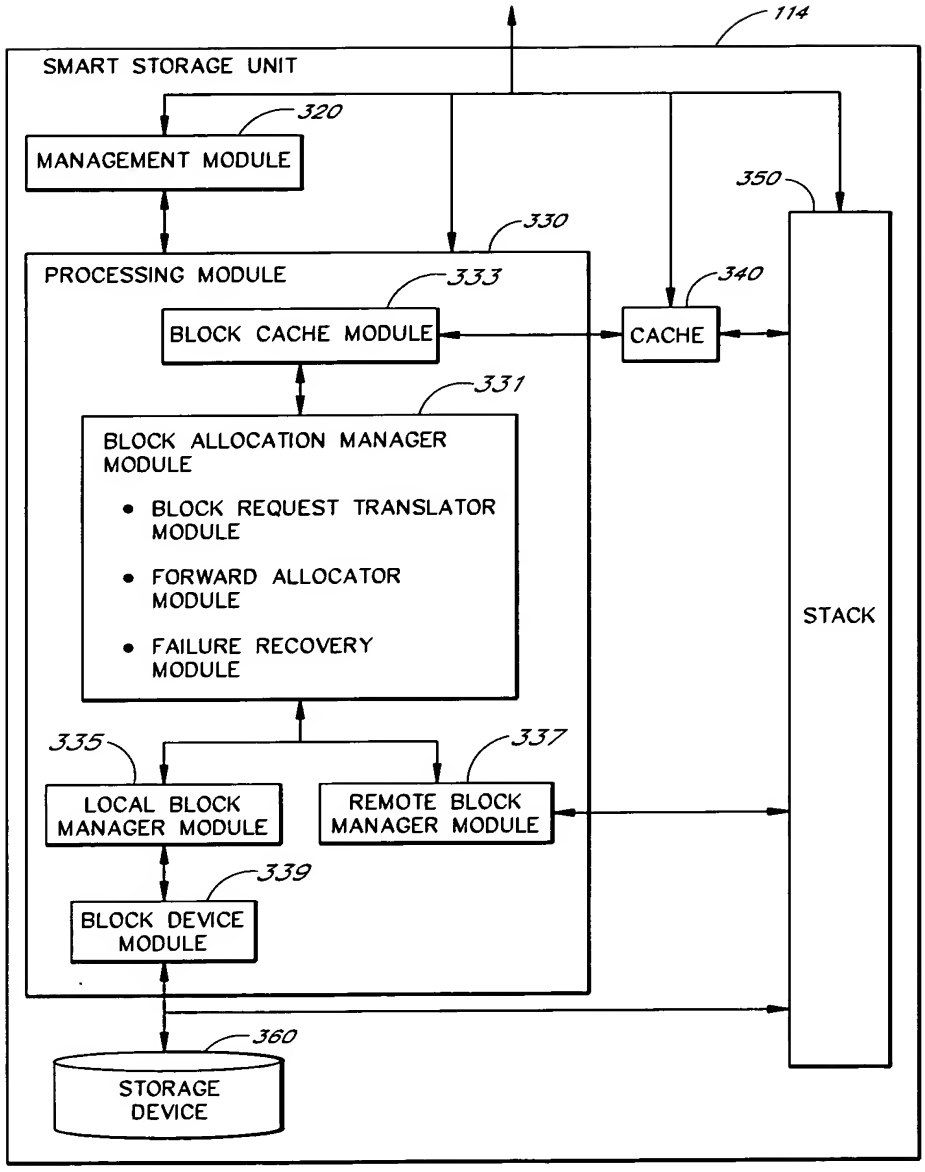

114
SMART STORAGE UNIT
320
MANAGEMENT MODULE
350
330
PROCESSING MODULE
333
340
BLOCK CACHE MODULE
CACHE
331
BLOCK ALLOCATION MANAGER MODULE
• BLOCK REQUEST TRANSLATOR MODULE
• FORWARD ALLOCATOR MODULE
• FAILURE RECOVERY MODULE
STACK
335
337
LOCAL BLOCK MANAGER MODULE
REMOTE BLOCK MANAGER MODULE
339
BLOCK DEVICE MODULE
360
STORAGE DEVICE

FIG. 3

Fasset-2556/2005

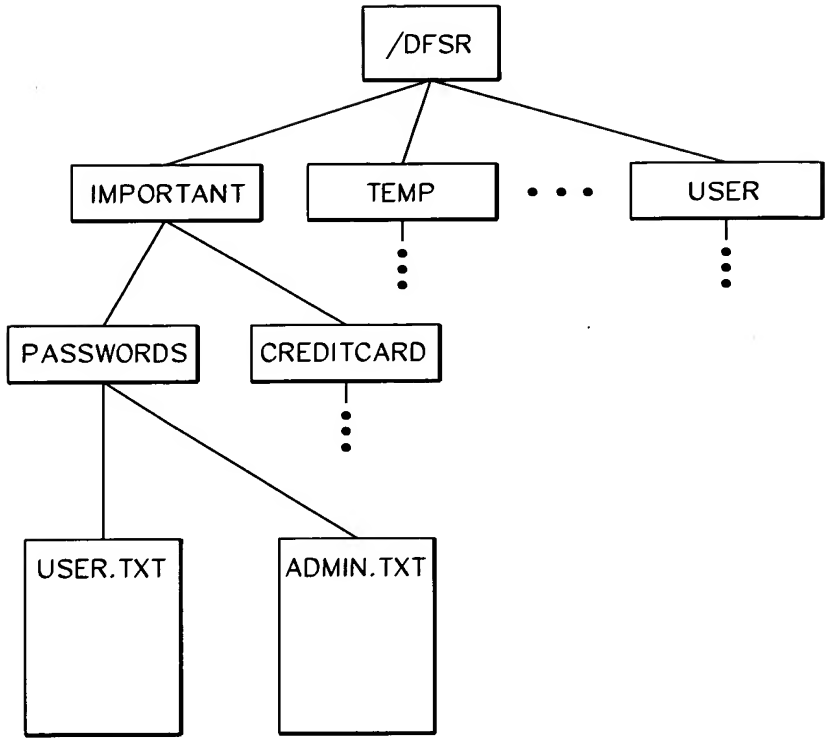


FIG. 4

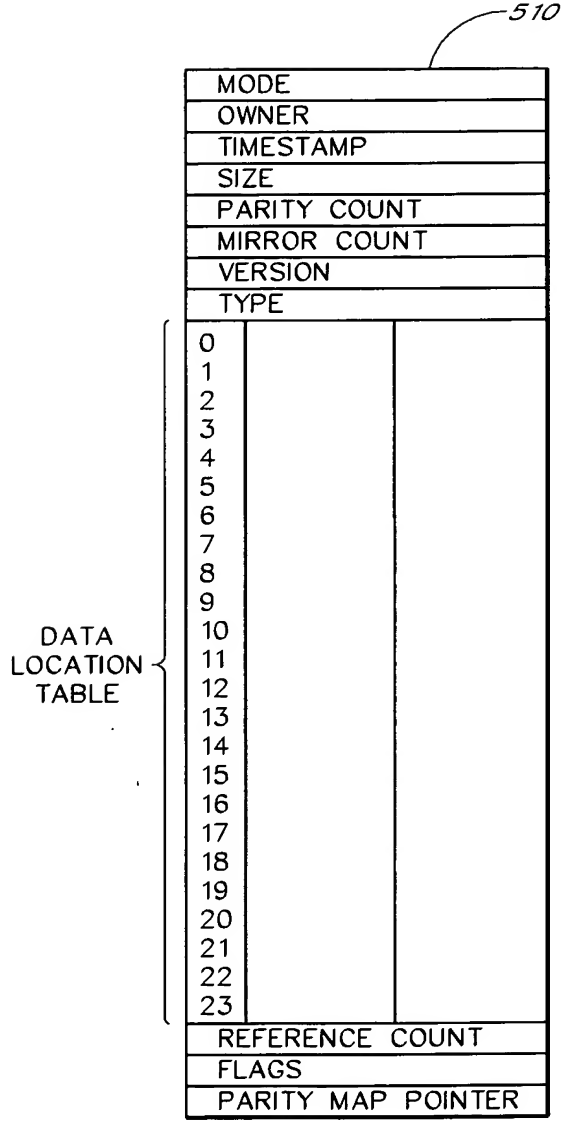

510
MODE
OWNER
TIMESTAMP
SIZE
PARITY COUNT
MIRROR COUNT
VERSION
TYPE
DATA LOCATION TABLE
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
REFERENCE COUNT
FLAGS
PARITY MAP POINTER

FIG. 5

TYPE 0

	DEVICE	BLOCK	
0			D0
1			D1
2			D2
3			D3
4			D4
5			D5
6			D6
7			D7
8			D8
9			D9
10			D10
11			D11
12			D12
13			D13
14			D14
15			D15
16			D16
17			D17
18			D18
19			D19
20			D20
21			D21
22			D22
23			D23

FIG. 6A

TYPE 1

	DEVICE	BLOCK	
0			D0
1			D1
2			D2
3			D3
4			D4
5			D5
6			D6
7			D7
8			D8
9			D9
10			D10
11			D11
12			D12
13			D13
14			D14
15			SI0
16			DI0
17			TI0
18			SI1
19			DI1
20			TI1
21			SI2
22			DI2
23			TI2

FIG. 6B

TYPE 2

	DEVICE	BLOCK	
0			SI0
1			DI0
2			TI0
3			SI1
4			DI1
5			TI1
6			SI2
7			DI2
8			TI2
9			SI3
10			DI3
11			TI3
12			SI4
13			DI4
14			TI4
15			SI5
16			DI5
17			TI5
18			SI6
19			DI6
20			TI6
21			SI7
22			DI7
23			TI7

FIG. 6C

TYPE 3

	DEVICE	BLOCK	
0			TI0
1			TI1
2			TI2
3			TI3
4			TI4
5			TI5
6			TI6
7			TI7
8			TI8
9			TI9
10			TI10
11			TI11
12			TI12
13			TI13
14			TI14
15			TI15
16			TI16
17			TI17
18			TI18
19			TI19
20			TI20
21			TI21
22			TI22
23			TI23

FIG. 6D

Microsoft Exhibit 1005
Page 0015

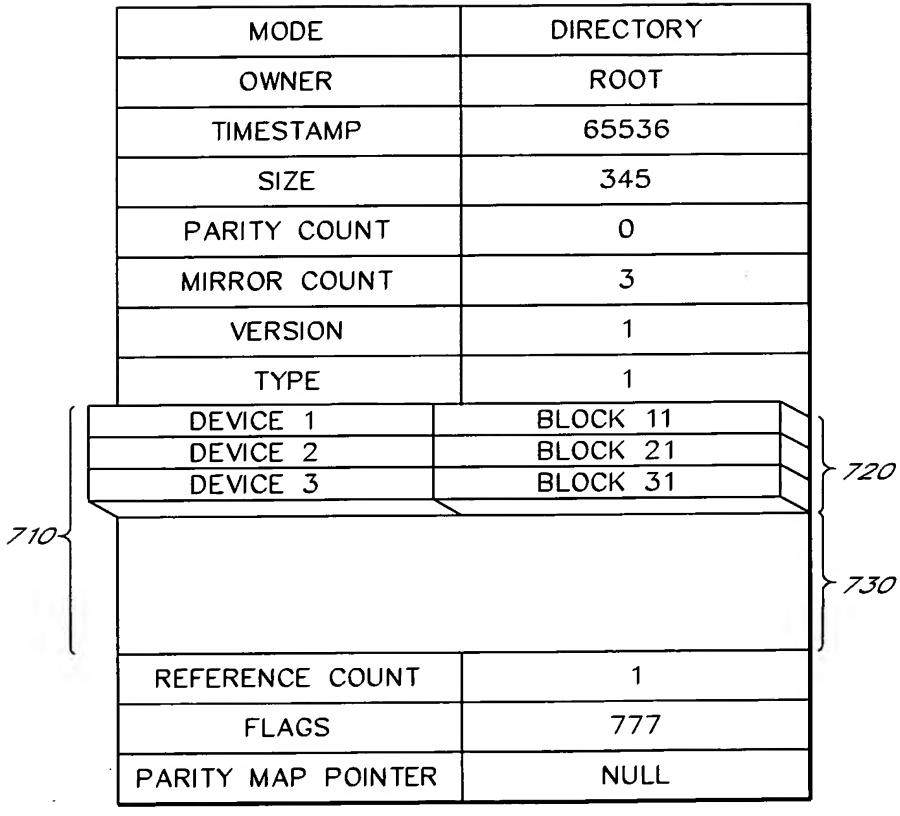


FIG. 7A

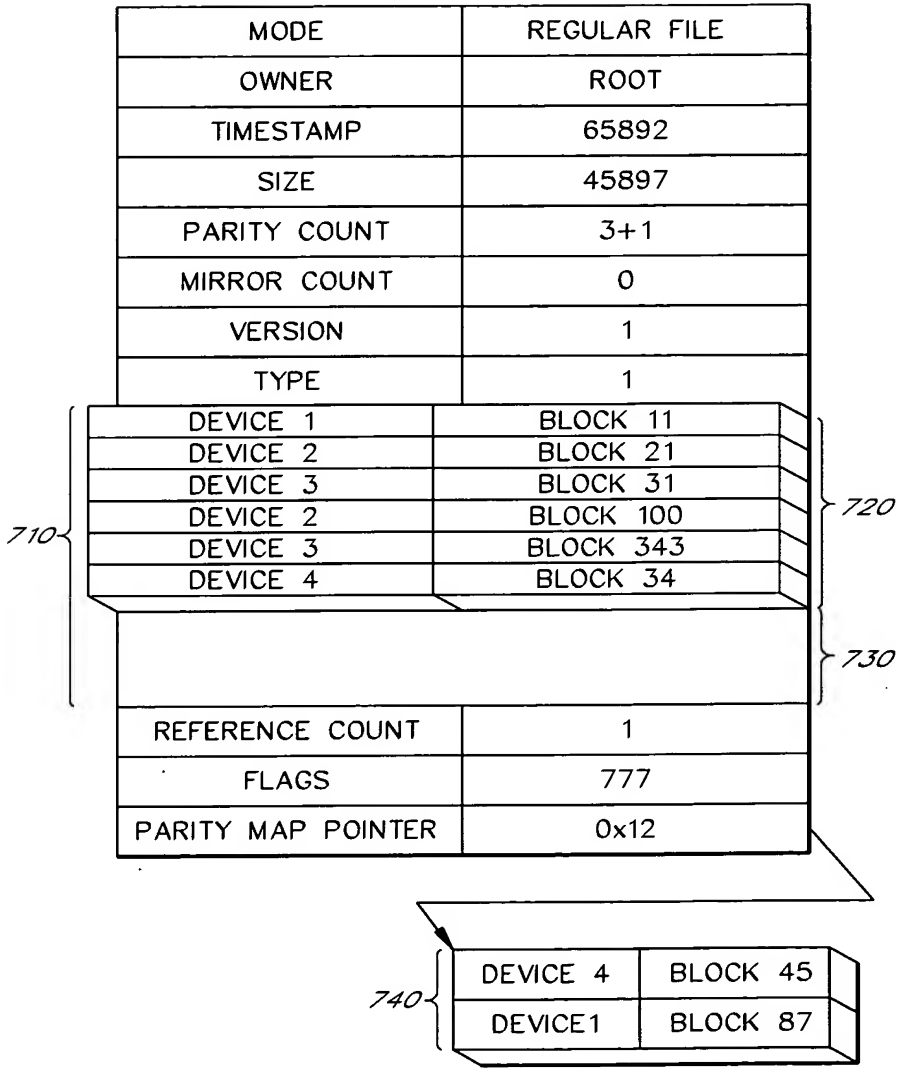

MODE
REGULAR FILE
OWNER
ROOT
TIMESTAMP
65892
SIZE
45897
PARITY COUNT
3+1
MIRROR COUNT
0
VERSION
1
TYPE
1
DEVICE 1
BLOCK 11
DEVICE 2
BLOCK 21
DEVICE 3
BLOCK 31
DEVICE 2
BLOCK 100
DEVICE 3
BLOCK 343
DEVICE 4
BLOCK 34
710
720
730
REFERENCE COUNT
1
FLAGS
777
PARITY MAP POINTER
0x12
740
DEVICE 4
BLOCK 45
DEVICE1
BLOCK 87

FIG. 7B

Fobort 20020001

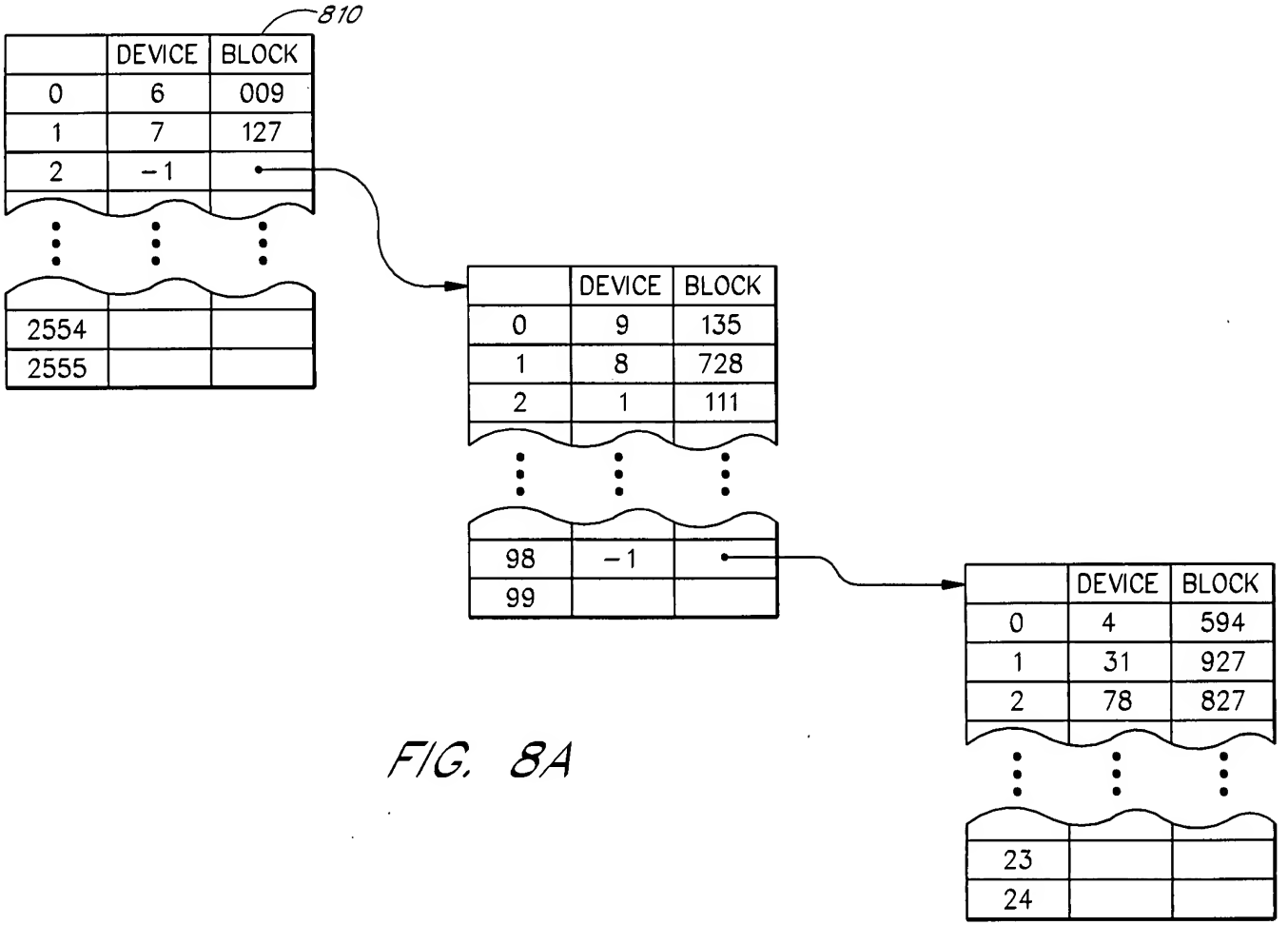


FIG. 8A

FOGGIT 20020001

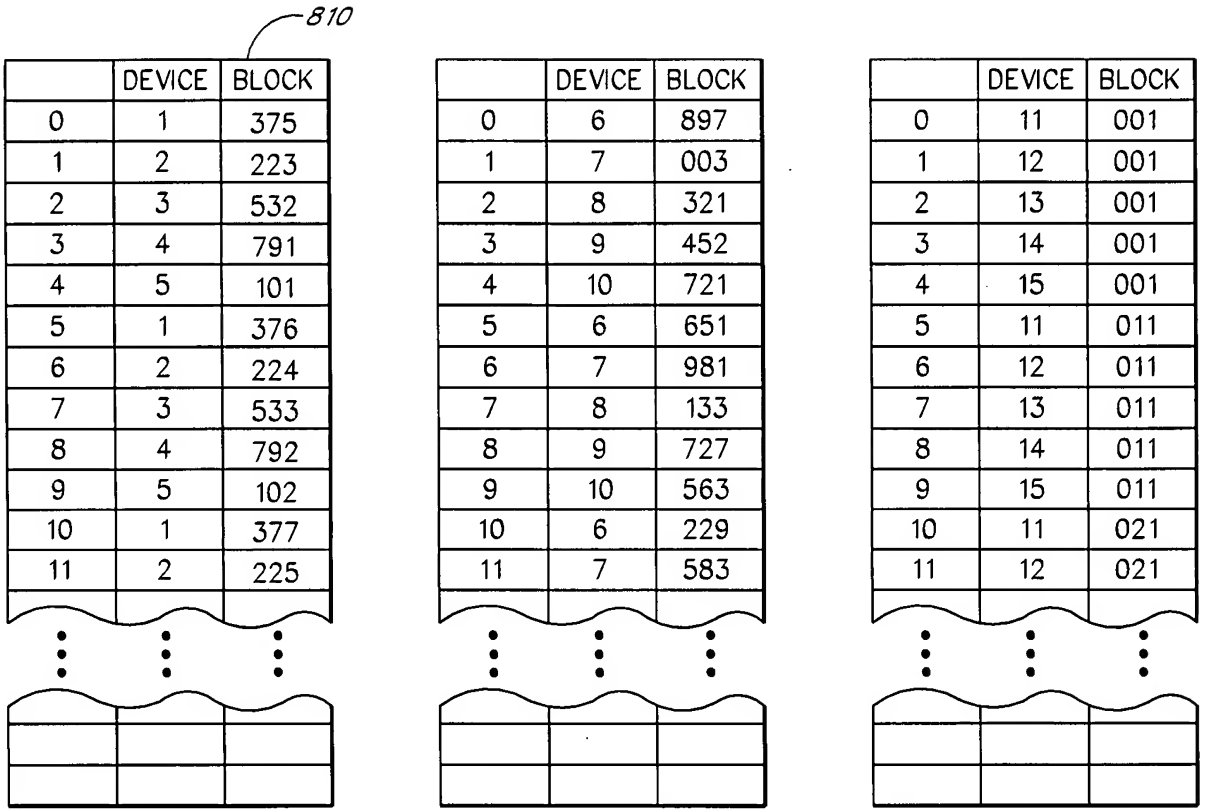


FIG. 8B

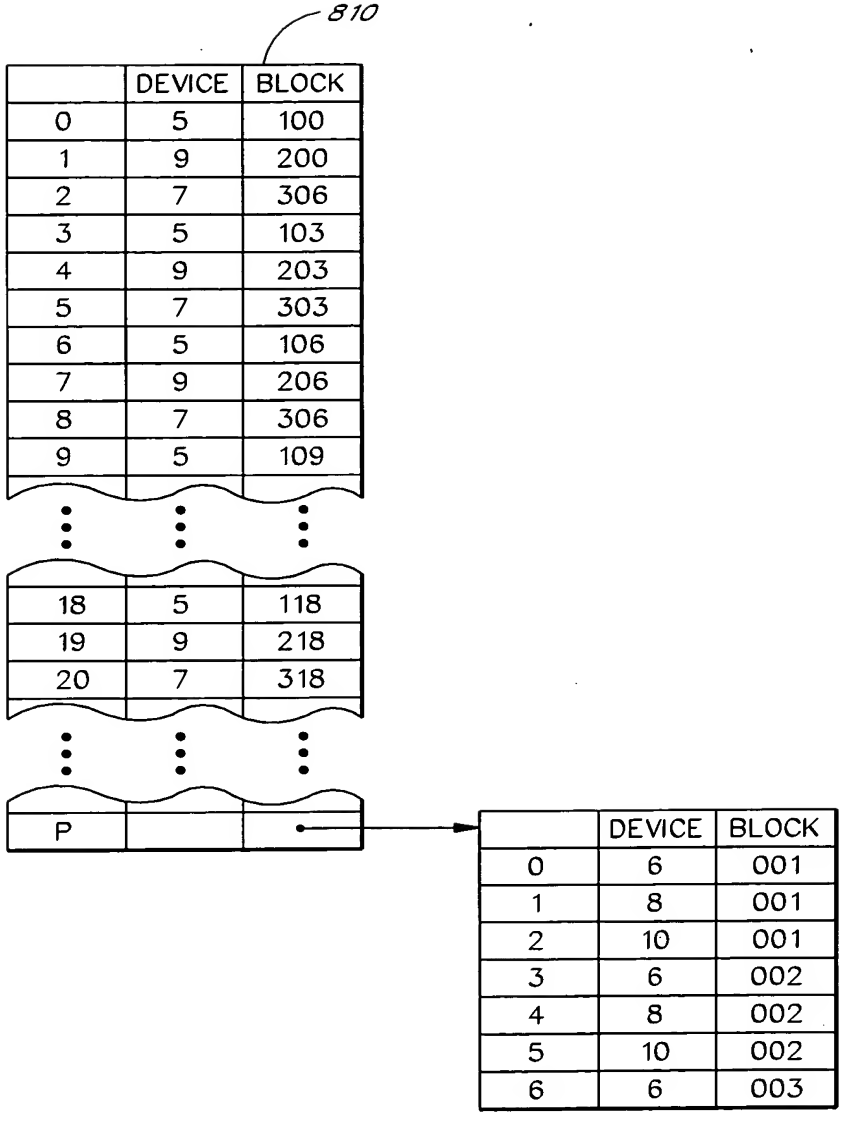
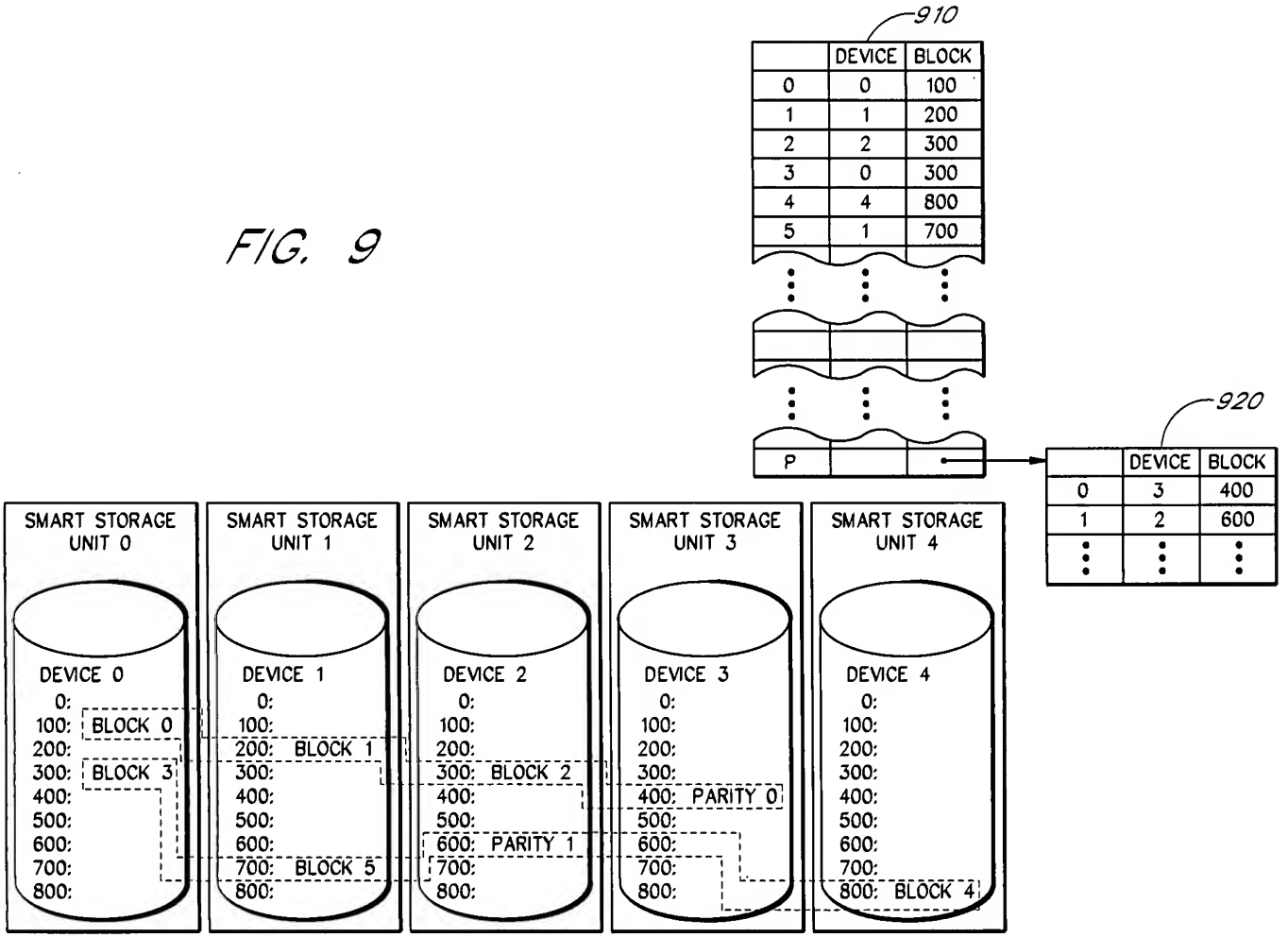

810
DEVICE
BLOCK
0 5 100
1 9 200
2 7 306
3 5 103
4 9 203
5 7 303
6 5 106
7 9 206
8 7 306
9 5 109
18 5 118
19 9 218
20 7 318
P
DEVICE
BLOCK
0 6 001
1 8 001
2 10 001
3 6 002
4 8 002
5 10 002
6 6 003

FIG. 8C

Fabian "20020001

FIG. 9



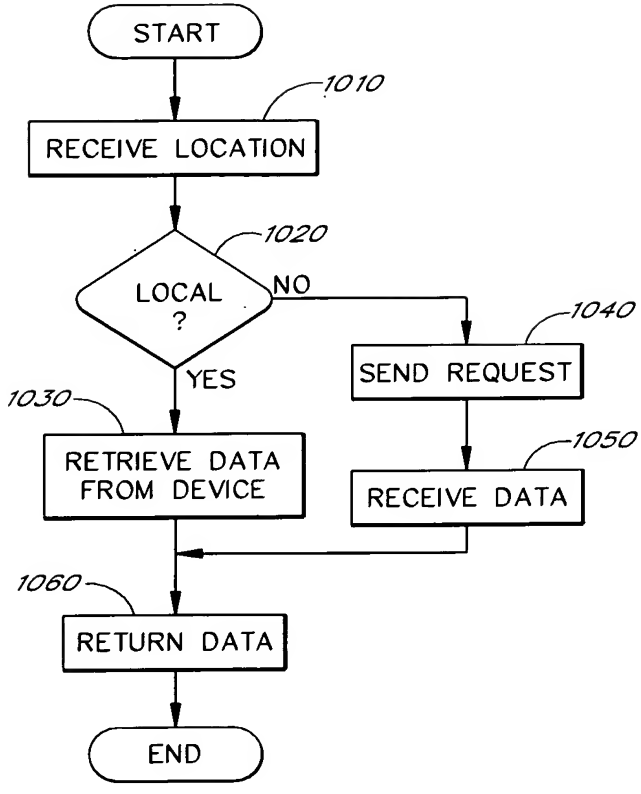

START
1010
RECEIVE LOCATION
1020
LOCAL ?
NO
YES
1040
SEND REQUEST
1030
RETRIEVE DATA FROM DEVICE
1050
RECEIVE DATA
1060
RETURN DATA
END

FIG. 10

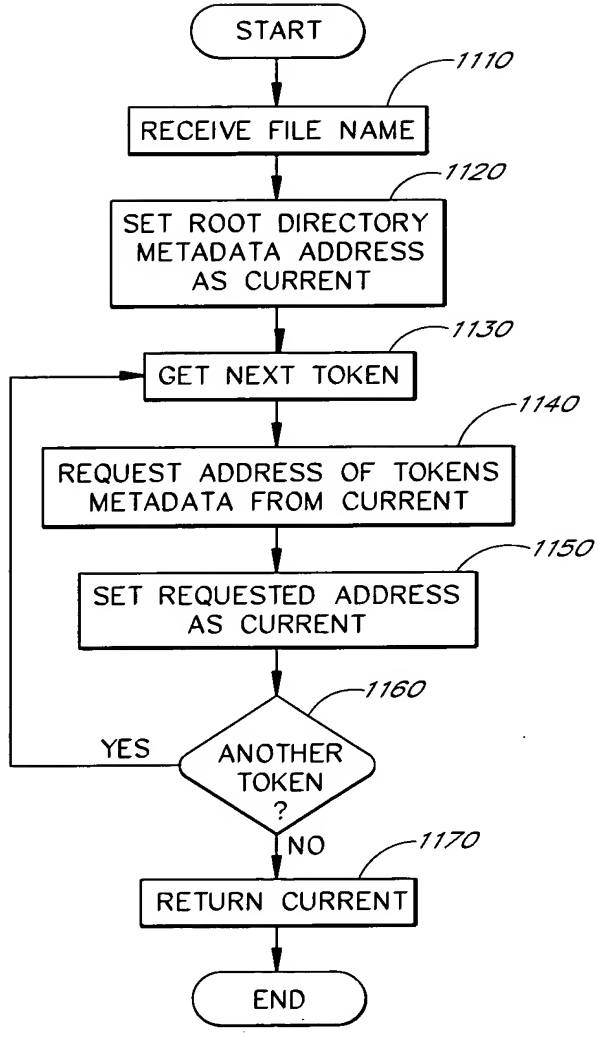

START
1110
RECEIVE FILE NAME
1120
SET ROOT DIRECTORY METADATA ADDRESS AS CURRENT
1130
GET NEXT TOKEN
1140
REQUEST ADDRESS OF TOKENS METADATA FROM CURRENT
1150
SET REQUESTED ADDRESS AS CURRENT
1160
ANOTHER TOKEN ?
YES
NO
1170
RETURN CURRENT
END

FIG. 11

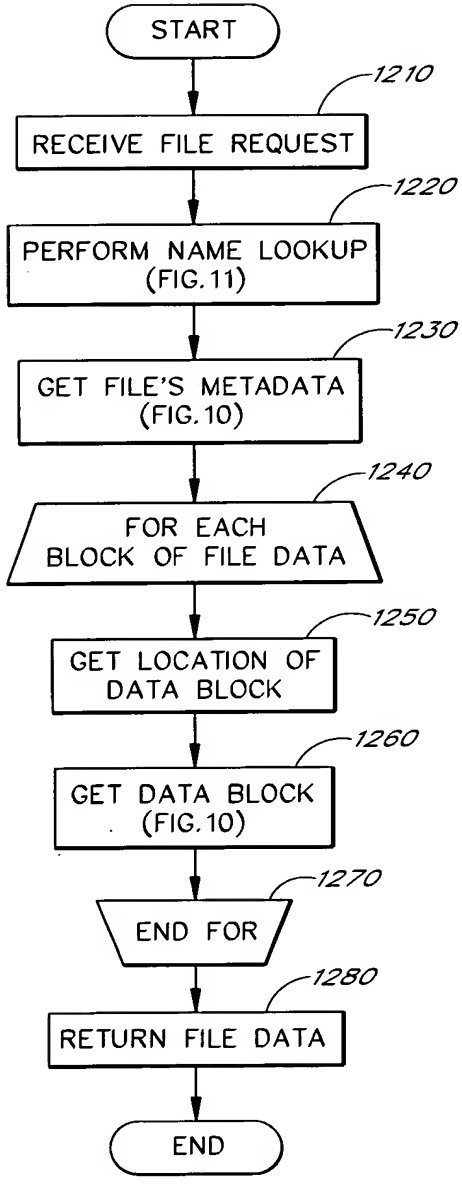

START
1210
RECEIVE FILE REQUEST
1220
PERFORM NAME LOOKUP (FIG. 11)
1230
GET FILE'S METADATA (FIG. 10)
1240
FOR EACH BLOCK OF FILE DATA
1250
GET LOCATION OF DATA BLOCK
1260
GET DATA BLOCK (FIG. 10)
1270
END FOR
1280
RETURN FILE DATA
END

FIG. 12

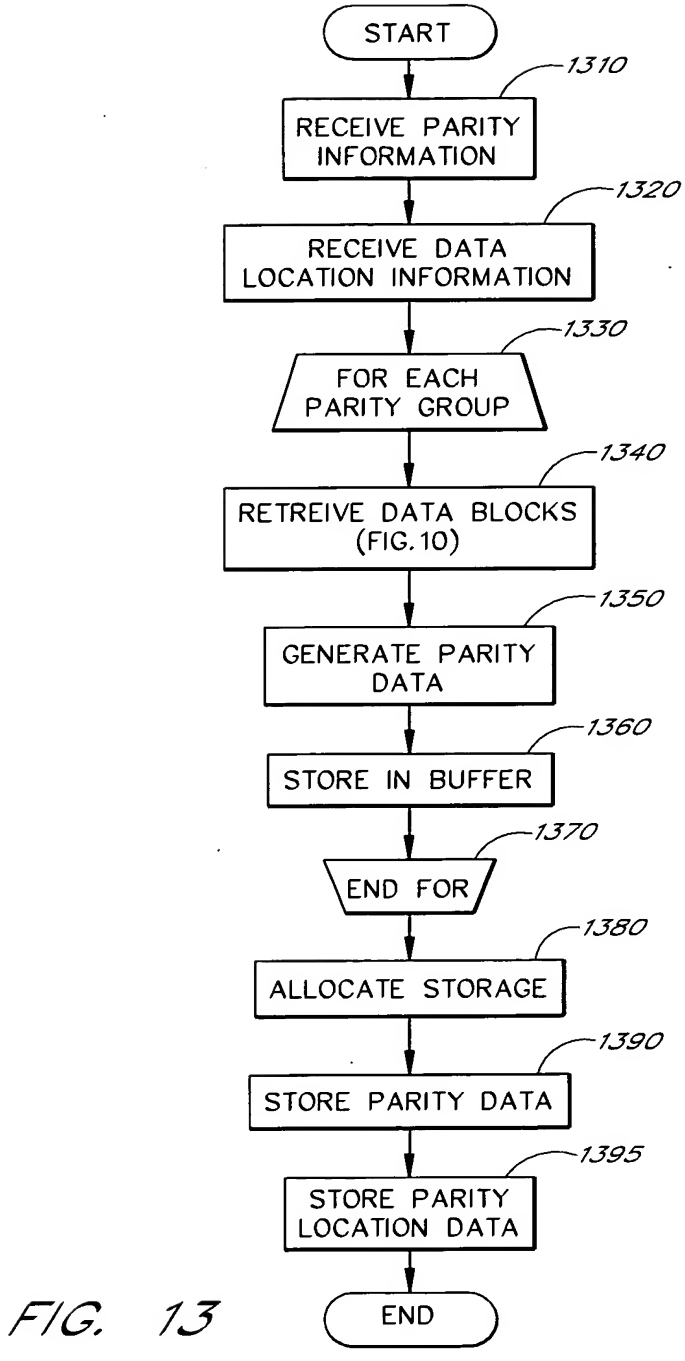

START
1310
RECEIVE PARITY INFORMATION
1320
RECEIVE DATA LOCATION INFORMATION
1330
FOR EACH PARITY GROUP
1340
RETREIVE DATA BLOCKS (FIG. 10)
1350
GENERATE PARITY DATA
1360
STORE IN BUFFER
1370
END FOR
1380
ALLOCATE STORAGE
1390
STORE PARITY DATA
1395
STORE PARITY LOCATION DATA
END

FIG. 13

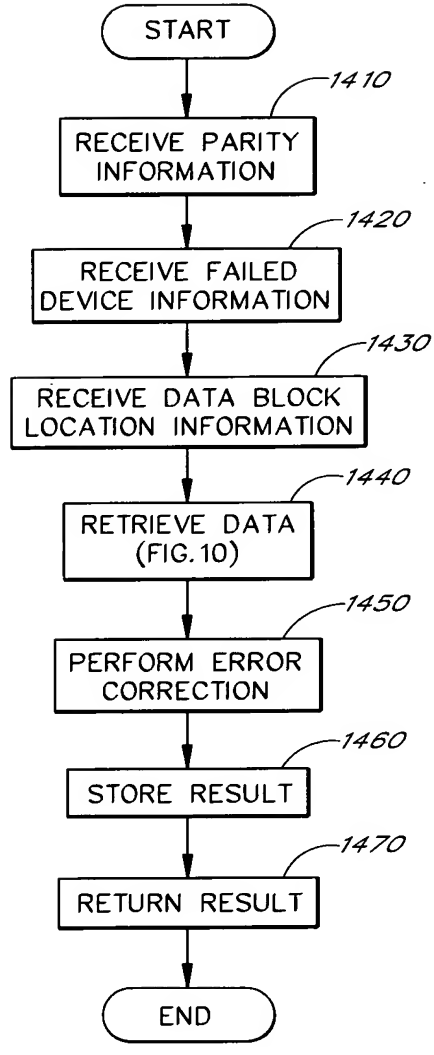

START
1410
RECEIVE PARITY INFORMATION
1420
RECEIVE FAILED DEVICE INFORMATION
1430
RECEIVE DATA BLOCK LOCATION INFORMATION
1440
RETRIEVE DATA (FIG. 10)
1450
PERFORM ERROR CORRECTION
1460
STORE RESULT
1470
RETURN RESULT
END

FIG. 14